



Figure in file

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JDF-3 DNA polymerase nucleotide sequence: 2331 nucleotides (SEQ ID NO: 1)

ATGATCCTTGACGTTGATTACATCACCGAGAATGGAAAGCCCGTCATCAGGGTCTTCAAGAAGGAGAACGG
CGAGTTTCAGGATTGAATACGACCGCGAGTTCGAGCCCTACTTCTACGCGCTCCTCAGGGACGACTCTGCCA
TCGAAGAAATCAAAAAGATAACCGCGGAGAGGCACGGCAGGGTCGTTAAGGTTAAGCGCGCGGAGAAGGTG
AAGAAAAAGTTCTCGGCAGGTCTGTGGAGGTCTGGGTCTCTACTTCACGCACCCGCAGGACGTTCCGGC
AATCCGCGACAAAATAAGGAAGCACCCCGCGGTTCATCGACATCTACGAGTACGACATACCCTTCGCCAAGC
GCTACCTCATAGACAAGGGCCTAATCCCGATGGAAGGTGAGGAAGAGCTTAACTCATGTCTTCGACATC
GAGACGCTCTACCACGAGGGGAGAAGAGTTTGGAAACCGGGCCGATTCTGATGATAAGCTACGCCGATGAAAG
CGAGGCGCGCGTGATAACCTGGAAGAAGATCGACCTTCCTTACGTTGAGGTTGTCTCCACCGAGAAGGAGA
TGATTAAGCGCTTCTTGAGGGTCGTTAAGGAGAAGGACCCGGACGTGCTGATAACATAACAACGGCGACAAC
TTCGACTTCGCCTACCTGAAAAAGCGCTGTGAGAAGCTTGGCGTGAGCTTTACCCTCGGGAGGGACGGGAG
CGAGCCGAAGATACAGCGCATGGGGGACAGGTTTGGCGTCGAGGTGAAGGGCAGGGGTACACTTCGACCTTT
ATCCAGTCATAAGGCGCACCATAAACCTCCCGACCTACACCTTGAGGCTGTATACGAGGCGGTTTTTCGGC
AAGCCCAAGGAGAAGGTCTACGCCGAGGAGATAGCCACCGCTGGGAGACCGGCGAGGGGCTTGAGAGGGT
CGCGCGCTACTCGATGGAGGACGCGAGGGTTACCTACGAGCTTGGCAGGGAGTTCTTCCCGATGGAGGCC
AGCTTTTCAGGCTCATCGGCCAAGGCCTCTGGGACGTTTCCCGCTCCAGCACCGGCAACCTCGTCGAGTGG
TTCCTCCTAAGGAAGGCCTACGAGAGGAACGAACCTCGCTCCCAACAAGCCCGACGAGAGGGAGCTGGCGAG
GAGAAGGGGGGGCTACgC CGGTGGCTACGTCAAGGAGCCGGAGCGGGGACTGTGGGACAATATCGTGTATC
TAGACTTTTCGTAGTCTCTACCTTCAATCATAATCACCCACAACGTCTCGCCAGATACGCTCAACCGCGAG
GGGTGTAGGAGCTACGACGTTGCCCCGAGGTCGGTCAACAAGTTCTGCAAGGACTTCCCCGGCTTCATTCC
GAGCCTGTCTCGGAAACCTGCTGGAGGAAAGGCAGAAGATAAAGAGGAAGATGAAGGCAACTCTCGACCCGC
TGGAGAAGAATCTCCTCGATTACAGGCAACGCGCCATCAAGATTCTCGCCAACAGCTACTACGGCTACTAC
GGCTATGCCAGGGCAAGATGGTACTGCAGGGAGTGCGCCGAGAGCGTTACGGCATGGGGAAGGGAGTACAT
CGAAATGGTCATCAGAGAGCTTGAGGAAAAGTTCGGTTTTAAAGTCCTCTATGCAGACACAGACGGTCTCC
ATGCCACCATTCTTGAGCGGACGCTGAAACAGTCAAGAAAAAGGCAATGGAGTTCTTAAACTATATCAAT
CCCAAACTGCCCCGCCCTTCTCGAACTCGAATACGAGGGCTTCTACGTCAGGGGCTTCTTCGTACGAAGAA
AAAGTACGCGGTTCATCGACGAGGAGGGCAAGATAACCACGCGCGGGCTTGAGATAGTCAGGCGCGACTGGA
GCGAGATAGCGAAGGAGACGCGAGGCGAGGGTTTTGGAGGCGATACTCAGGCACGGTGACGTTGAAGAGGCC
GTCAGAATTGTCAGGGAAGTCACCGAAAAGCTGAGCAAGTACGAGGTTCCGCCGAGAGAAGCTGGTTATCCA
CGAGCAGATAACGCGCGAGCTCAAGGACTACAAGGCCACCGGCCCGCACGTAGCCATAGCGAAGcGTTTTGG
CCGCCAGAGGTGTTAAATCCGGCCCGGAACGTGTGATAAGCTACATCGTTCTGAAGGGCTCCGGAAGGATA
GGCGACAGGGCGATTCCCTTCGACGAGTTCGACCCGACGAAGCACAAGTACGATGCGGACTACTACATCGA
GAACCAGGTTCTGCCGGCAGTTGAGAGAATCCTCAGGGCCTTCGGCTACCGCAAGGAAGACCTGCGCTACC
AGAAGACGAGGCAGGTCGGGCTTGGCGCGTGGCTGAAGCCGAAGGGGAAGAAGAAGTGA

FIG. 2.
JDF-3 DNA polymerase amino acid sequence (SEQ ID NO: 2)
Theoretical molecular weight: 90.3 kD

MILDVDYITENGKPVIRVFKKENGFEFRIEYDREFEPYFYALLRDDS AIEEIKKITAERHGRVVVKVRAEKV
KKKFLGRSVEVWVLYFTHPQDVPAIRDKIRKHPAVIDIYEYDIPFAKRYLIDKGLIPMEGEEELKLMSFDI
ETLYHEGEEFGTGPILMISYADESEARVITWKKIDLPYVEVVSTEKEMIKRFLRVVKEKDPDVLITYNGDN
FDFAYLKKRCEKLGVSFTLGRDGSEPKIQRMGDRFAVEVKGRVHFDLYPVIRRTINLPTYTLEAVYEAVFG
KPKEKVYAEIATAWETGEGLEVARYSMEDARVTYELGREFFPMEAQLSRLIGQGLWDVSRSSSTGNLVEW
FLLRKAYERNELAPNKPDERELARRRGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSPDTLNRE
GCRSYDVAPEVGHKFKCDFPGFIPSLLGNNLEERQKIKRKMKATLDPLEKNLLDYRQRAIKILANSYYGYY
GYARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYADTDGLHATIPGADAETVKKKAMEFLNYIN
PKLPGLLELEYEGFYVRGFFVTKKKYAVIDEEGKITTRGLEIVRRDWSEIAKETQARVLEAILRHGDVEEA
VRIVREVTEKLSKYEVPPEKLVIEHQITRELKDYKATGPHVAIAKRLAARGVKIRPGTVISYIVLKGSGRI
GDRAIPFDEFDPTKHKYDADYYIENQVLP AVERILRAFGYRKEDLRYQKTRQVGLGAWLKPKGKKK

FIG. 3.

JDF-3 DNA polymerase with intein sequence (SEQ ID NO: 3)

MILDVDYITENGKPVIRVFKKENGEFRIEYDREFEPYFYALLRDDS AIEE
IKKITAERHGRVVKVKRAEKVKKKFLGRSVEVWVLYFTHPQDVPAIRDKI
RKHPAVIDIYDYDIPFAKRYLIDKGLIPMEGEEELKLSFDIETLYHEGE
EFGTGPILMISYADESEARVITWKKIDLPYVEVVSTEKEMIKRFLRVVKE
KDPDVLITYNGDNFDFAYLKRCCEKLGVSFTLGRDGSEP KIQRMGDRFAV
EVKGRVHFDLYPVIRRTINLPTYTLEAVYEAVFGKPKKVKYAEIATAWE
TGEGLERVARYSMEDARVTYELGREFFPMEAQLSRLIGQGLWDVSRSTG
NLVEWFLLRKAYERNELAPNKPDERELARRRGYAGGYVKEPERGLWDNI
VYLDFRSLYPSIIITHNVSPDTLNREGCRSYDVAPEVGHKFKCDFPGFIP
SLLGNLLEERQKIKRKMKATLDPLEKNLLDYRQRAIKILAN

Extein 1

SLLPGEWVA
VIEGGKLRPVRIGELVDGLMEASGERVKRDGDTEVLEVEGLYASPSTGSP
RKPAQCR*KP**GTAMPGKfte*LSTPEGGLSVTRGHSLFAYRDASLWR*
RGRRRFKPGDLLAVPSG*PSRRGGRGSTSLNCSSNCPRRKRPTCHRHSGK
GRKNFFRGMRLRTLWI FGEKGTGGRPGATWSTLRGLGYVKLRKIGYGVVD
REGLGKVPFRFYERLVEVIRYNGNRGEFIADFNALRPVLRIMMPEKELEEW
LVGTRNGFRIRPFIEVDWKFAKLLGYVSEGSAGKWKNTGGWSYSVRLY
NEDGSVLDDMERLARSSLGA*ARGELRRDFKEDGLHNLRGALRFTGREQE
GSVAYLHVP*GGPLGLP*GVLHRRRRRSPEQDGSALHQERASG*RPRPAP
ELAGRLSDKRPPRQRLQGLRERGTALYRVPEAEERLTYSHVIPREVLEE
TSAGPSRRT*VTGNSGSWWKAGSSTRKGPVG*AGSSTGI*SSTGSRKSGR
KATRGTTT*ALRRTRTSGGLWVPLRAQX

Intein 1

SYYGYYGYARARWYCRECAES
VTAWGREYIEMVIRELEEKFGFKVLYADTDGLHATIPGADAETVKKKAME
FLNYINPKLPGLLELEYEGFYVRGFFVTKKKYAVIDEEGKITTRGLEIVR
RDWSEIAKETQARVLEAILRHGDVEEAVRIVREVTEKLSKYEVPPEKLVI
HEQITRELKDYKATGPHVAIAKRLAARGVKIRPGTVISYIVLKGSGRIGD
RAIPFDEFDPTKHKYDADYYIENQVLP AVERILRAFGYRKEDLRYQKTRQ
VGLGAWLKPKGKKK

Extein 2

FIG. 4.
JDF-3 DNA polymerase genomic sequence (SEQ ID NO: 4)

AATTCCACTGCCGTGTTTAACCTTTCCACCGTTGAACTTGAGGGTGATT
TCTGAGCCTCCTCAATCACTTAATCGAGACCGCGATTACCTTGAACGG
TACACGTTCAACGATTCCGGTTCCTGTAATGGTCGATACTGGGCCGTGCTG
GATTTTCTAAACGTCTCAAGAACGGCTTTCATCAACGGAACTGCCACGT 5' untranslated sequence
CTCCGCCGTCTGAGGGTTAAACCTGAAGTTCAAGACTTTGCAACGGAA
GGCGAGAGAACGGCGACTACCCAGTGAAGAGCTTTTGAAAGCCAAAGC
CGAGCTTCAGCGAATGTGCGGTGCCCTTGTTCAAGAGTTGTGAGCCCTTG
ATTGTTGTTTCTCCTCTTTCTGATAACATCGATGGCGAAGTTTATTAG
TTCTCAGTTCGATAATCAGGCAGGTGTTGGTC

ATGATCCTTGACGTTGAT
TACATCACCGAGAATGGAAAGCCCGTCATCAGGGTCTTCAAGAAGGAGAA
CGGCGAGTTCAGGATTGAATACGACCGCGAGTTCGAGCCCTACTTCTACG
CGTCTCTCAGGGACGACTCTGCCATCGAAGAAATCAAAAAGATAACCGCG
GAGAGGCACGGCAGGGTCGTAAAGTTAAGCGCGCGGAGAAGGTGAAGAA
AAAGTTCCTCGGCAGGTCTGTGGAGGTCTGGGTCTCTACTTCACGCACC
CGCAGGACGTTCCGGCAATCCGCGACAAAATAAGGAAGCACCCCGCGGTG
ATCGACATCTACGAGTACGACATACCCTTCGCCAAGCGCTACCTCATAGA
CAAGGGCCTAATCCCGATGGAAGGTGAGGAAGAGCTTAACTCATGTCTCT
TCGACATCGAGACGCTCTACCACGAGGGAGAAGAGTTTGGAAACGGGCCG
ATTCTGATGATAAGCTACGCCGATGAAAGCGAGGCGCGCTGATAACCTG
GAAGAAGATCGACCTTCCTTACGTTGAGGTTGTCTCCACCGAGAAGGAGA
TGATTAAGCGCTTCTTGAGGGTCGTAAAGGAGAAGGACCCGGACGTGCTG
ATAACATACAACGGCGACAACCTTCGACTTCGCCTACCTGAAAAAGCGCTG
TGAGAAGCTTGGCGTGAGCTTTACCCTCGGGAGGGACGGGAGCGAGCCGA Extein 1
AGATACAGCGCATGGGGGACAGGTTTGCGGTGAGGTGAAGGGCAGGGTA
CACTTCGACCTTTATCCAGTCATAAGGCGCACCATAAACCTCCCGACCTA
CACCCTTGAGGCTGTATACGAGGCGGTTTTTCGGCAAGCCCAAGGAGAAGG
TCTACGCCGAGGAGATAGCCACCGCTGGGAGACCGGCGAGGGGCTTGAG
AGGGTCGCGCGCTACTCGATGGAGGACGCGAGGGTTACCTACGAGCTTGG
CAGGGAGTTCTTCCCGATGGAGGCCAGCTTTCAGGCTCATCGGCCAAG
GCCTCTGGGACGTTTCCCGCTCCAGCACCGGCAACCTCGTCGAGTGTTTC
CTCCTAAGGAAGGCCTACGAGAGGAACGAACCTCGCTCCCAACAAGCCCGA
CGAGAGGGAGCTGGCGAGGAGAAGGGGGGGCTACGCCGGTGGCTACGTCA
AGGAGCCGGAGCGGGGACTGTGGGACAATATCGTGTATCTAGACTTTTCGT
AGTCTCTACCCTTCAATCATAATCACCCACAACGTCTCGCCAGATACGCT
CAACCGCGAGGGGTGTAGGAGCTACGACGTTGCCCCGAGGTGCGTCACA
AGTTCTGCAAGGACTTCCCGGCTTCATTCCGAGCCTGCTCGGAAACCTG
CTGGAGGAAAGGCAGAGATAAAGAGGAAGATGAAGGCAACTCTCGACCC
GCTGGAGAAGAATCTCCTCGATTACAGGCAACGCGCCATCAAGATTCTCG
CCAAC

AGCCTTCTTCCCGGGAGTGGGTTGCGGTCATTGAAGGGGGGAAA
CTCAGGCCCGTCCGCATCGGCGAGCTGGTTGATGGACTGATGGAAGCCAG
CGGGGAGAGGGTGAAAAGAGACGGCGACACCGAGGTCCTTGAAGTCGAGG
GGCTTTACGCCTCTCCTTCGACAGGGAGTCCAAGAAAGCCCGCACAATGC
CGGTGAAAGCCGTGATAAGGCACCGCTATGCCGGGAAGTTTACAGAATA
GCTCTCAACTCCGGAAGGAGGATTAAGCGTGACGCGCGGCCACAGCCTCT
TCGCGTACCGGGACGCGAGCTTGTGGAGGTGACGGGGGAGGAGGAGGTTT
AAGCCCGGCGACCTCCTGGCGGTGCCAAGCGGATAACCTCCCGGAGAGG
Intein 1

AGGGAGAGGCTCAACATCGTTGAACTGCTCCTCGAACTGCCCCGAGGAGGA
AACGGCCGACATGTCATCGACATTCCGGCAAGGGTAGAAAGAACTTCTTC
AGGGGAATGCTCAGAACCTCCGCTGGATTTTCGGGGAGGAGAAGACCGG Intein 1
AGGGCGGCCAGGCGCTACCTGGAGCACCTTGCGTGGGCTCGGCTACGTGA
AGCTGAGGAAAATCGGCTACGGGGTGGTTGATAGGGAGGGAAGTGGGAAAG
GTACCGCGCTTCTACGAGAGGCTCGTGGAGGTAATCCGCTACAACGGCAA
CAGGGGGGAGTTCATCGCCGATTTCAACGCGCTCCGCCCCGTCTCCGCC
TGATGATGCCCCGAGAAGGAGCTTGAAGAGTGGCTCGTTGGGACGAGGAAC
GGGTTTCAAGATAAGGCCGTTTATAGAGGTTGATTGGAAGTTGCAAAGCT
CCTCGGCTACTACGTGAGCGAGGGGAGCGCCGGGAAGTGGAAAAACCGGA
CCGGGGGCTGGAGCTACTCGGTGAGGCTTTACAACGAGGACGGGAGCGTT
CTCGACGACATGGAGAGACTCGCGAGGAGTTCTTTGGGGGCGTGAGCGCG
GGGGGAACCTACGTGAGATTTCAAAGAAGATGGCCTACATAATCTTCGAG
GGGCTCTGCGGTTTACCGGCCGAGAACAAAGAGGGTTCCGTGGCTTATCTT
CACGTCCCCTGAGGAGGTCCGCTGGGCCTTCTTTGAGGGGTACTTCATCG
GCGACGGCGACGTTTACCCGAGCAAGATGGTTTCGGCTCTCCACCAAGAGC
GAGCTTCTGGCTAACGGCCTCGTCTGCTCCTGAACTCGCTGGGCGTCTC
AGCGATAAACGTCCGCCACGACAGCGGGGTTTACAGGGTCTACGTGAACG
AGGAAGTGCCTTTTACAGAGTACCGGAAGCGGAAGAAGCCTCACTTACT
CCCACGTACATCCGAGGGAAGTGTGGAGGAGACTTCGGCCGGGCCTTCC
AGAAGAACATGAGTCACGGGAAATTCAAGGAGCTGGTGGAAAGCGGGGAG
CTCGACGCGGAAAGGGCCGGTAGGATAGGCTGGCTCCTCGACGGGGATAT
AGTCCTCGACAGGGTCTCGGAAGTCAGGAAGGAAAGCTACGAGGGGTACG
TCTACGACCTGAGCGTTGAGGAGGACGAGAACTTCTGGCGGGCTTTGGGT
TCCTCTACGCGCACAAACNN

AGCTACTACGGCTACTACGGCTATGCCAGGG
CAAGATGGTACTGCAGGGAGTGCGCCGAGAGCGTTACGGCATGGGGAAGG
GAGTACATCGAAATGGTCATCAGAGAGCTTGAGGAAAAGTTTCGGTTTTAA
AGTCCTCTATGCAGACACAGACGGTCTCCATGCCACCATTCTTGAGCGG
ACGCTGAAACAGTCAAGAAAAAGGCAATGGAGTTCTTAACTATATCAAT
CCCAAAGTGCCTCGGCTTCTCGAACTCGAATACGAGGGCTTCTACGTGAG
GGGCTTCTTTCGTACGAAGAAAAAGTACGCGGTTCATCGACGAGGAGGGCA
AGATAACCACGCGCGGGCTTGAGATAGTCAGGCGCGACTGGAGCGAGATA
GCGAAGGAGACGCGAGGCGAGGGTTTTGGAGGCGATACTCAGGCACGGTGA Extein 2
CGTTGAAGAGGCCGTGAGAAATTGTGAGGGAAGTACCGAAAAGCTGAGCA
AGTACGAGGTTCCGCCGAGAAAGCTGGTTATCCACGAGCAGATAACGCGC
GAGCTCAAGGACTACAAGGCCACCGGCCGACGTAGCCATAGCGAAGCG
TTTGGCCGCCAGAGGTGTTAAATCCGGCCCGAACTGTGATAAGCTACA
TCGTTCTGAAGGGCTCCGGAAGGATAGGCGACAGGGCGATTCCCTTCGAC
GAGTTCGACCCGACGAAGCACAAAGTACGATGCGGACTACTACATCGAGAA
CCAGGTTCTGCCGCGAGTTGAGAGAATCCTCAGGGCCTTCGGCTACCGCA
AGGAAGACCTGCGCTACCAGAAGACGAGGCAGGTTCGGGCTTGGCGCGTGG
CTGAAGCCGAAGGGGAAGAAGAAGTGA

GGAATTATCTGGTTTCTTTTCCC
AGCATTAAATGCTTCCGACATTGCCTTATTTATGAACTCCTGTTGTGCC
TGAGTTTGTGCCAGAAAACAGCCTGTTCTGACGGCGCTTTTCTTGCCAG
GTCTCTTGAGTTTCGCAAGGGTCTTCTCGACCAGCTCAATGGTCTTGTCG
TCATTGTTTNNNNNNNNNNNNNNNNNNNNCCCGGGGACTTCATACTGGC
GGTAATAGACAGGGATTCTTCTCAAGGACTTCCCGGGAGGCATTGGAG
TTTTTTGGTGGGGCTTTCACAGGATTGCTCATCTTGTGGATTTCTCGTT
CGATTGAATCTGTCCACTTGAGGGTGTAGGTCGAGACGGTGGAGCGCGTA

TTCCGGGAGCGGGTCTTGAGGCTCCATTTTTTCAGTCCTCCTCCGGCGAAG 3' Untranslated sequence
AAGTGGAACCTCAAGCCGGGTGTTAGCTTATGTTATGTTCCCAACTCCTCC
AGCACCTCCAGGATCCCCCTCAATCCCGGAACCTCGAAGCCCCCTCTCGTGG
ATCTTTCTAACTTCCTCTGCCTCCGGGTTTATCCAGACCGCCACATGCC
GGCTCTCAGCGCACCCCTCGAAATCCTCCGCGTAGGTGTCGCCGATGTGGA
TTGCCTCGTCCGGCTCGACCCCGAAGCATCGAGCGGTTTTCTGAACATCT
CGGGCATCGGCTTATACGCCAGAACCCTCGTCGGCGAAGAAGGTTCCCTCA
ATGTAGTCCATCAGGCCGAACCTCTCGAGGGGGGGCCCGGTACCCAATTC
GCCCTATAGTGAGTCGATTACAATTCAGTGGCCGTCGTTTTACAACGTCG
TGACTGGGAAAACCCTGGCGTTACCCAACCTTAAGTCGCTTTGCAGCACAT
CCCCC

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Preliminary Qualification of Mutants

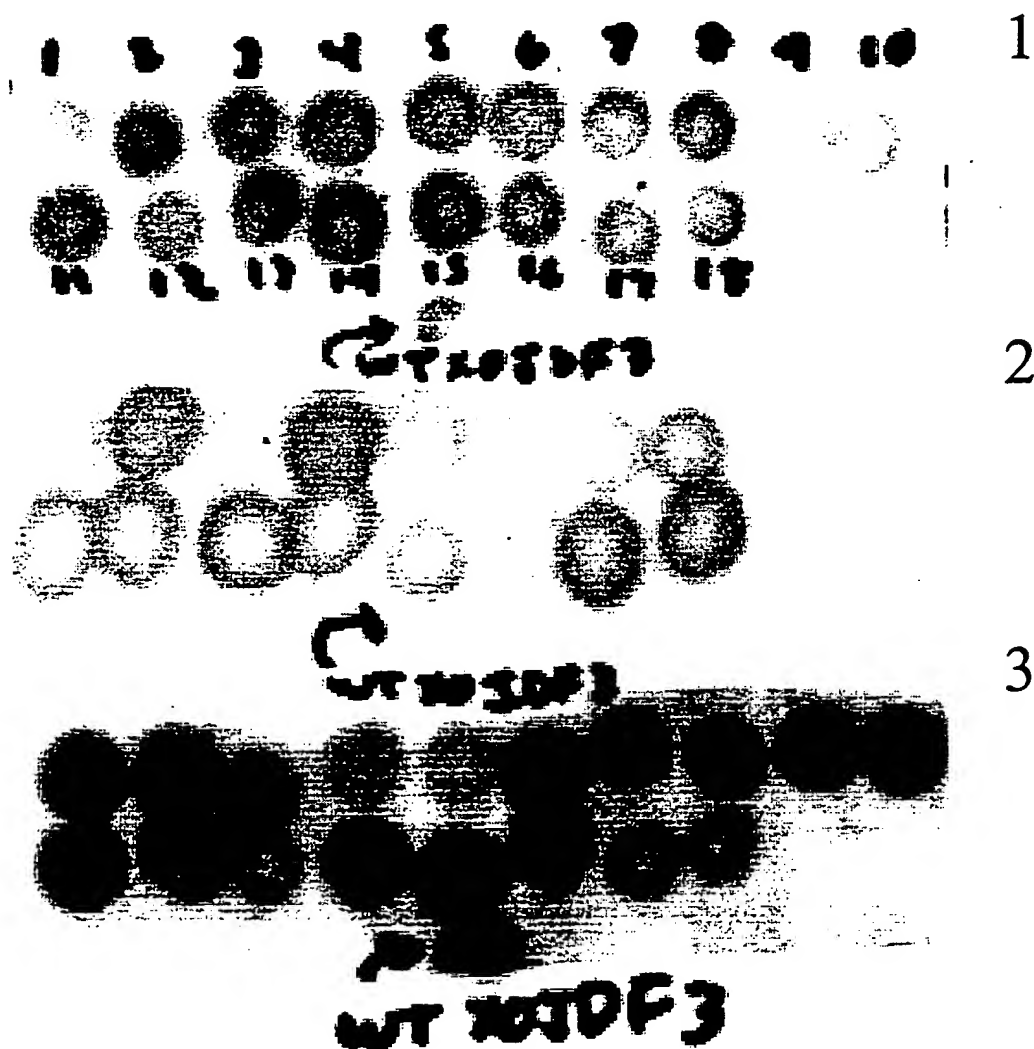


Figure 5

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Sequencing with Purified Mutants

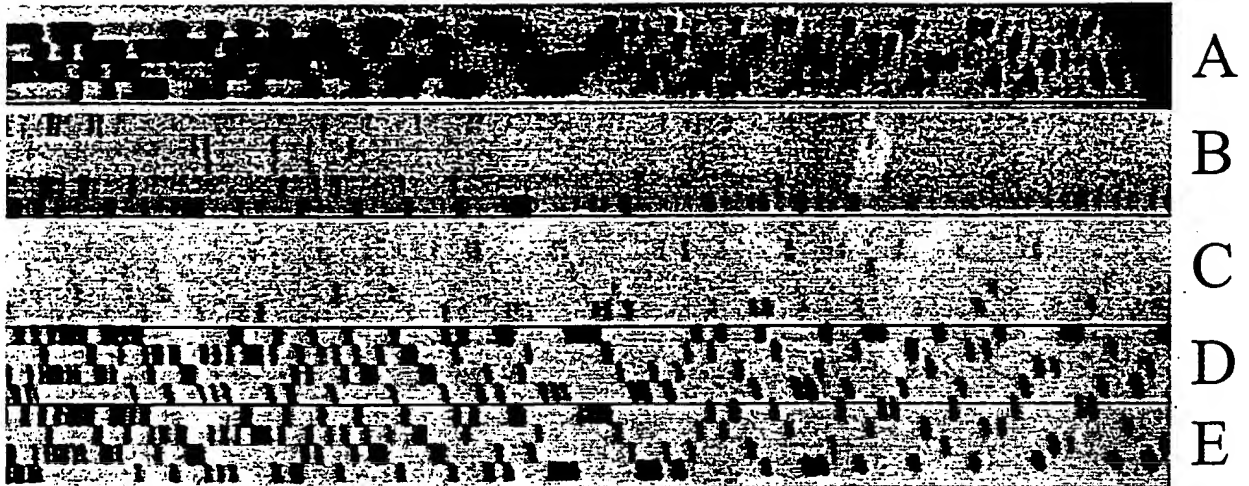


Figure 6

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Sequencing with Dye-labeled Dideoxynucleotides

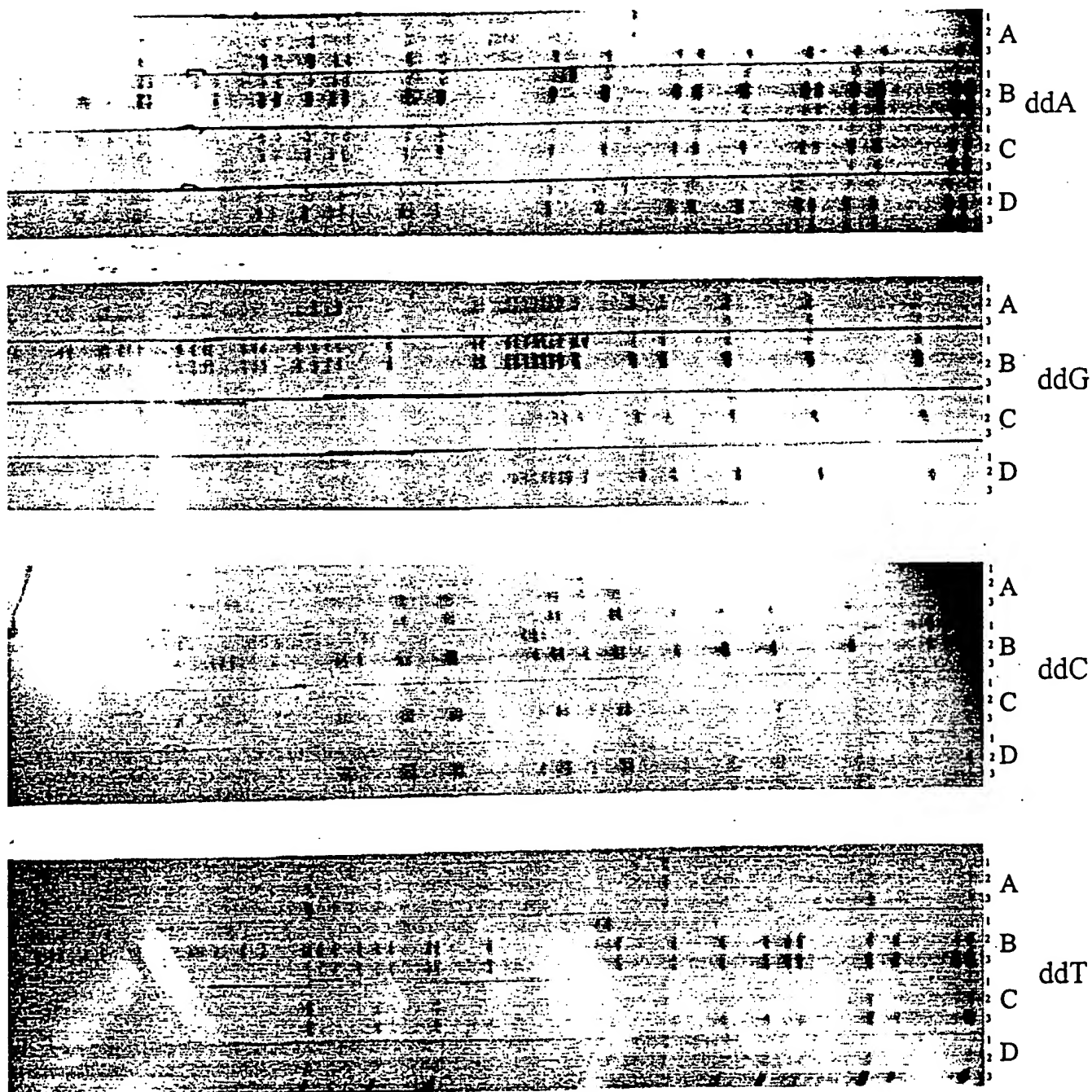


Figure 7

Sequencing with the P410L, A485T Double Mutant and α - ^{33}P Dideoxynucleotides

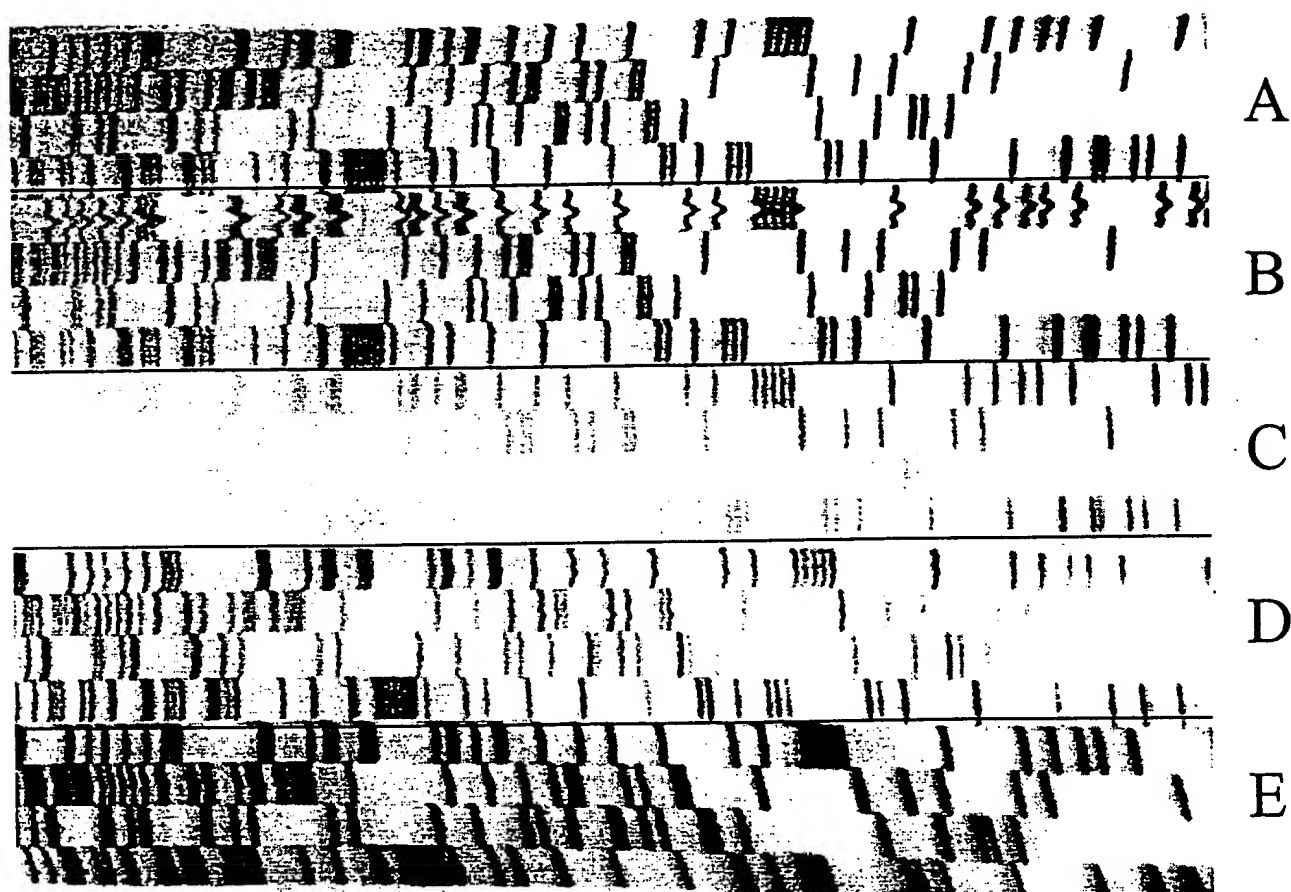
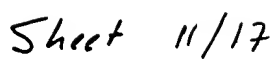


Figure 8

ENCLOSURE COPY



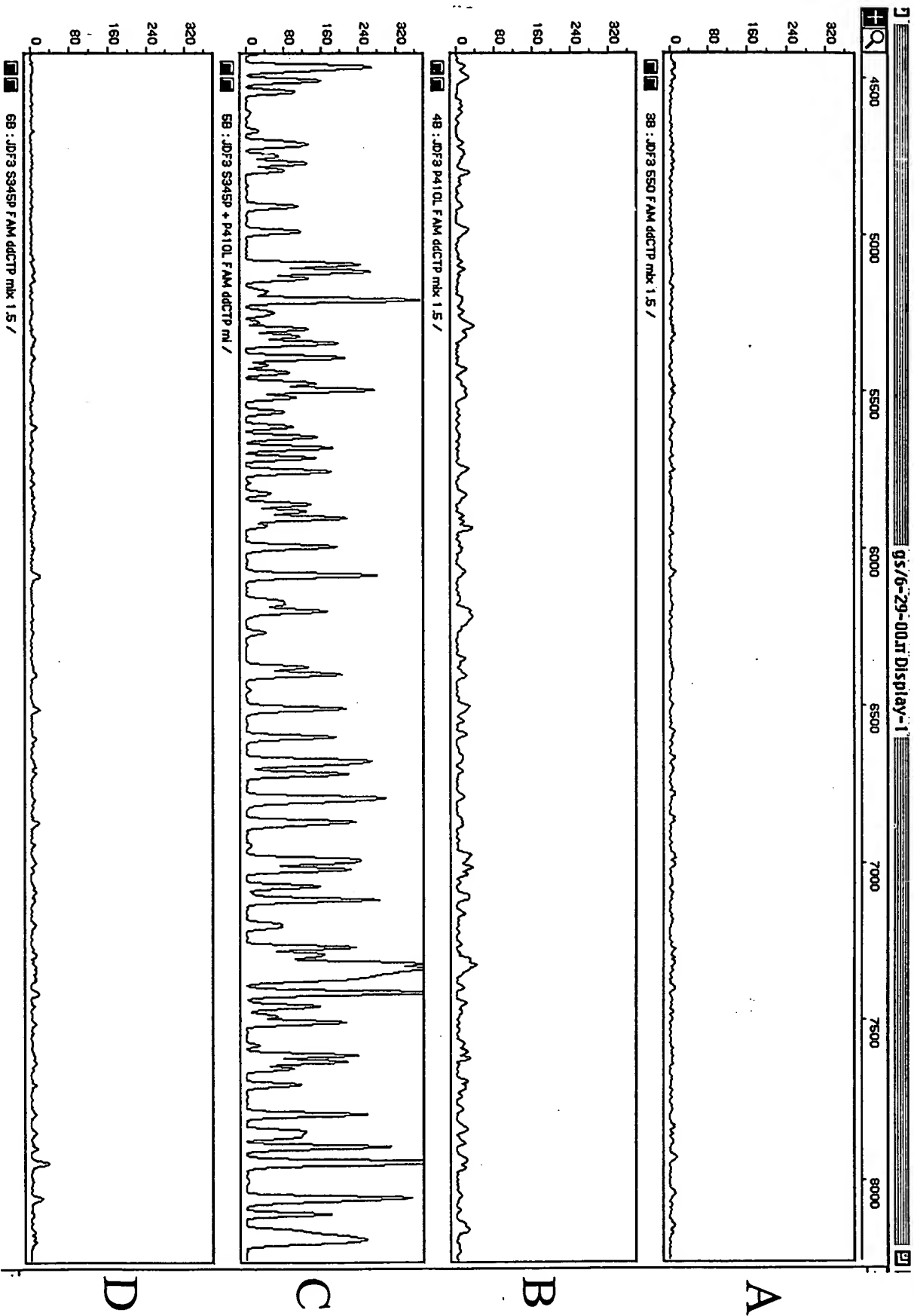


Figure 10

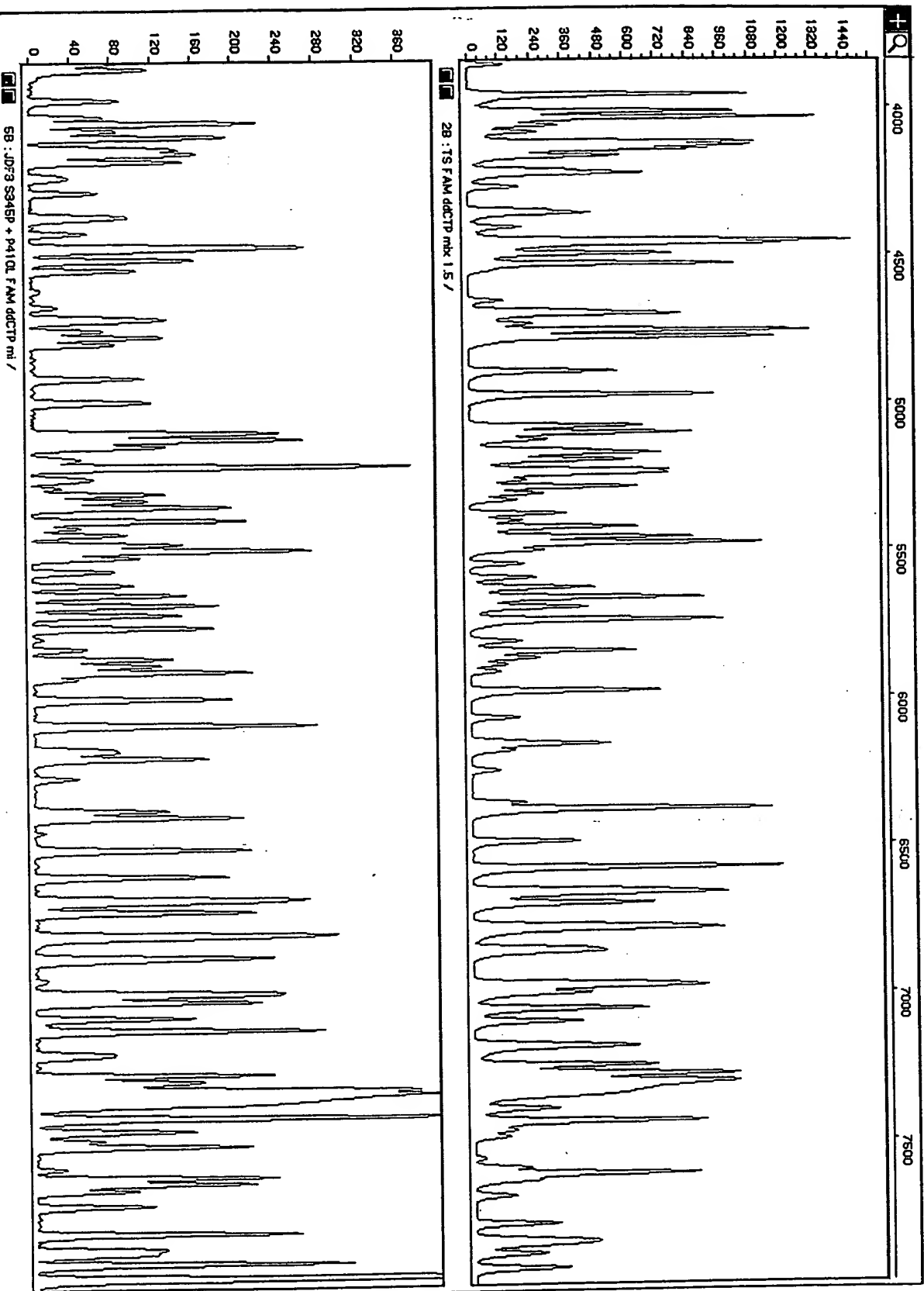


Figure 11

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^{33}P - TAACGTTGGGGGGGGGGCA →
TGCAACCCCCCCCCCGTAT

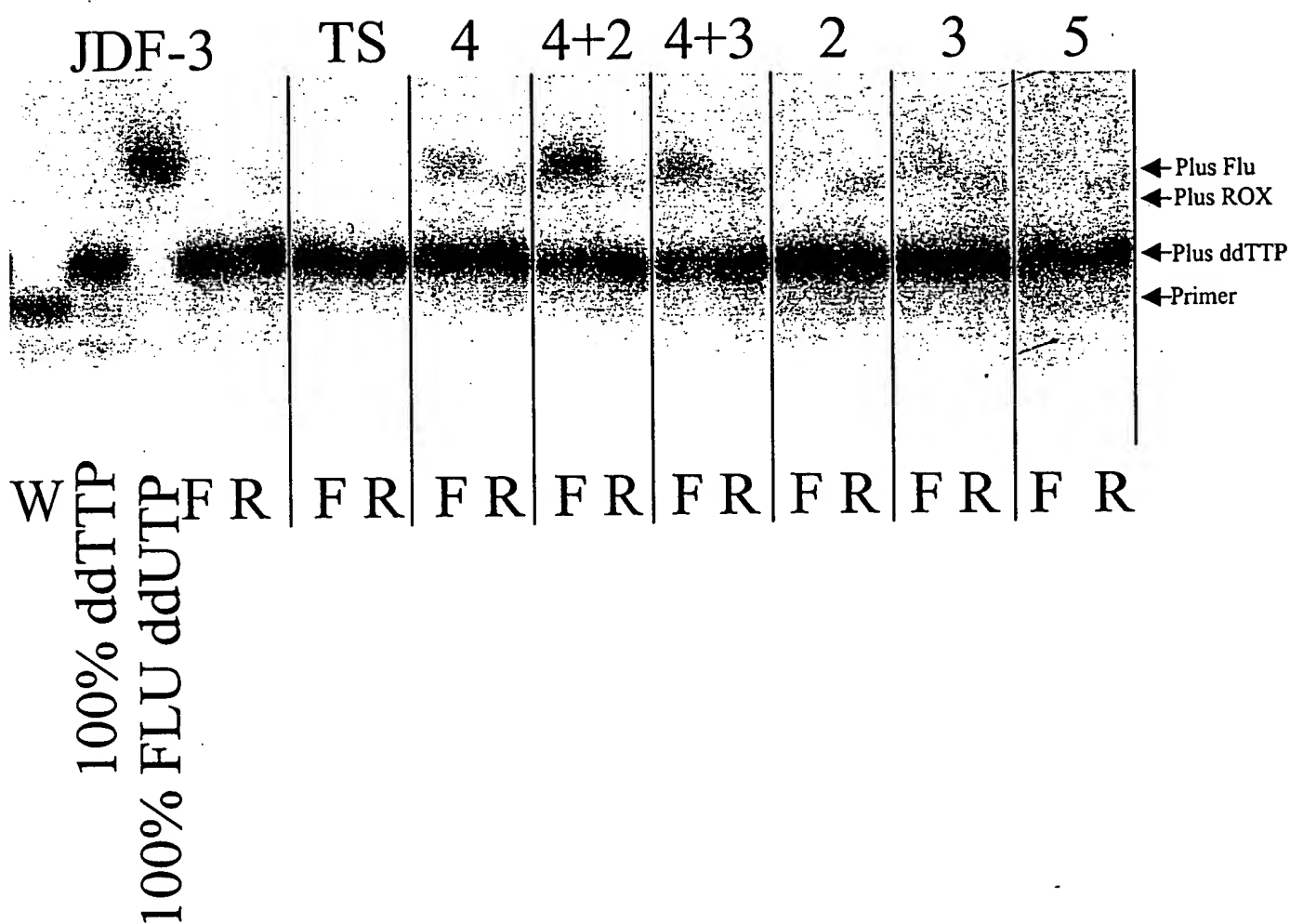


Figure 12

Flu ddUTP signal/ddTPP signal

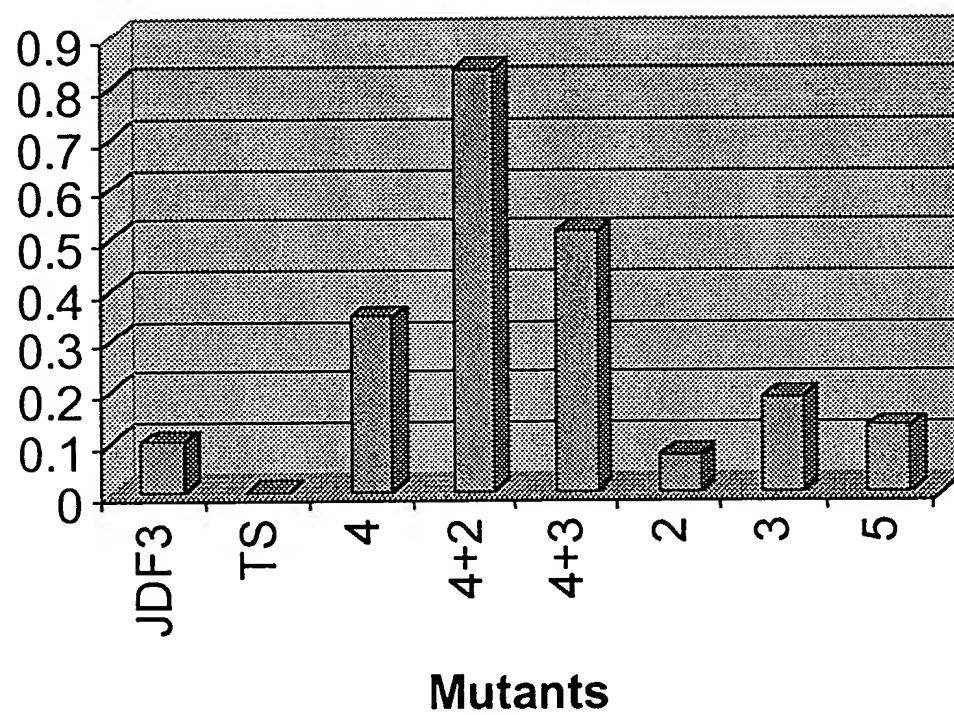


Figure 13

4	1	-----LVXNAXSTGNLVEWFLLRK
10	1	-----VWDVSRSTGNLVERFLLRK
13	1	-----VWDVSRSTGNLVEWFLLRK
16	1	-----VWDVSRSTGNLVEWFLLRK
18	1	-----VWDVSRSTGNLVEWFLLRK
19	1	-----VWDVSRSTGNLVEWFLLRK
28	1	-----VWDVSRSTGNLVEWFLLRK
34	1	-----VWDVSRSTGNLVEWFLLRK
41	1	-----VWDVSRSTGNLVEWFLLRK
33	1	-----VWDVSRSTGNLVEWFLLRK
48	1	-----YWSXPXLRTGNLVEWFLLRK
55	1	-----VIGTXPRSTGNLVEWFLLRK
64	1	-----XXXFWWDVSRSTGNLVEWFLLRK
Jdf3	301	TGGLERVARYSMEDARVTYELGREFFPMEAQLSRLIGQGVWDVSRSTGNLVEWFLLRK

4	20	AYERNELAPNKPDERELARRRGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
10	21	AYERNELAPNKPDERELARRRGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
13	21	AYERNELAPNKPDERELARRRGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
16	21	AYERNELAPNKPDERELARRRGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
18	21	AYERNELAPNKPDERELARRRGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
19	21	AYERNELAPNKPDERELARRRGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
28	21	AYERNELAPNKPDERELARRRGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
34	21	AYERNELAPNKPDERELARRRGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
41	21	AYERNELAPNKPDERELARRRGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
33	21	AYERNELAPNKPDERELARRRGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
48	21	AYERNELAPNKPDERELARRRGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
55	22	AYERNELAPNKPDERELARRRGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
64	24	AYERNELAPNKPDERELARRRGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
Jdf3	361	AYERNELAPNKPDERELARRRGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP

4	80	DTLNREGCRSYDVAPEVGHKFKDFPGFIPSLGNLLEERQKIKRKMKATLDPLEKNLLD
10	81	DTLNREGCRSYDVAPEVGHKFKDFPGFIPSLGNLLEERQKIKRKMKATLDPLEKNLLD
13	81	DTLNREGCRSYDVAPEVGHKFKDFPGFIPSLGNLLEERQKIKRKMKATLDPLEKNLLD
16	81	DTLNREGCRSYDVAPEVGHKFKDFPGFIPSLGNLLEERQKIKRKMKATLDPLEKNLLD
18	81	DTLNREGCRSYDVAPEVGHKFKDFPGFIPSLGNLLEERQKIKRKMKATLDPLEKNLLD
19	81	DTLNREGCRSYDVAPEVGHKFKDFPGFIPSLGNLLEERQKIKRKMKATLDPLEKNLLD
28	81	DTLNREGCRSYDVAPEVGHKFKDFPGFIPSLGNLLEERQKIKRKMKATLDPLEKNLLD
34	81	DTLNREGCRSYDVAPEVGHKFKDFPGFIPSLGNLLEERQKIKRKMKATLDPLEKNLLD
41	81	DTLNREGCRSYDVAPEVGHKFKDFPGFIPSLGNLLEERQKIKRKMKATLDPLEKNLLD
33	81	DTLNREGCRSYDVAPEVGHKFKDFPGFIPSLGNLLEERQKIKRKMKATLDPLEKNLLD
48	81	DTLNREGCRSYDVAPEVGHKFKDFPGFIPSLGNLLEERQKIKRKMKATLDPLEKNLLD
55	82	DTLNREGCRSYDVAPEVGHKFKDFPGFIPSLGNLLEERQKIKRKMKATLDPLEKNLLD
64	84	DTLNREGCRSYDVAPEVGHKFKDFPGFIPSLGNLLEERQKIKRKMKATLDPLEKNLLD
Jdf3	421	DTLNREGCRSYDVAPEVGHKFKDFPGFIPSLGNLLEERQKIKRKMKATLDPLEKNLLD

Figure 14

4	140	YRQRAIKILANSYYGYG	GYARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
10	141	YRQRAIKILANSYYGYG	GYARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
13	141	YRQRAIKILANSYYGYG	GYARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
16	141	YRQRAIKILANSYYGYG	GYARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
18	141	YRQRAIKILANSYYGYG	GYARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
19	141	YRQRAIKILANSYYGYG	GYARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
28	141	YRQRAIKILANSYYGYG	GYARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
34	141	YRQRAIKILANSYYGYG	GYARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
41	141	YRQRAIKILANSYYGYG	GYARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
33	141	YRQRAIKILANSYYGYG	GYARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
48	141	YRQRAIKILANSYYGYG	GYARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
55	142	YRQRAIKILANSYYGYG	GYARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
64	144	YRQRAIKILANSYYG	NYGYARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
Jdf3	481	YRQRAIKILANSYYGYG	GYARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD

4	200	TDGLHATIPGADAETVKKK	KAMEFLNYINPKLPGLLELEYEGFYVRGFFVTKKKYAVIDEE
10	201	TDGLHATIPGADAETVKKK	KAMEFLNYINPKLPGLLELEYEGFYVRGFFVTKKKYAVIDEE
13	201	TDGLHATIPGADAETVKKK	KAMEFLNYINPKLPGLLELEYEGFYVRGFFVTKKKYAVIDEE
16	201	TDGLHATIPGADAETVKKK	KAMEFLNYINPKLPGLLELEYEGFYVRGFFVTKKKYAVIDEE
18	201	TDGLHATIPGADAETVKKK	KAMEFLNYINPKLPGLLELEYEGFYVRGFFVTKKKYAVIDEE
19	201	TDGLHATIPGADAETVKKK	KAMEFLNYINPKLPGLLELEYEGFYVRGFFVTKKKYAVIDEE
28	201	TDGLHATIPGADAETVKKK	KAMEFLNYINPKLPGLLELEYEGFYVRGFFVTKKKYAVIDEE
34	201	TDGLHATIPGADAETVKKK	KAMEFLNYINPKLPGLLELEYEGFYVRGFFVTKKKYAVIDEE
41	201	TDGLHATIPGADAETVKKK	KAMEFLNYINPKLPGLLELEYEGFYVRGFFVTKKKYAVIDEE
33	201	TDGLHATIPGADAETVKKK	KAMEFLNYINPKLPGLLELEYEGFYVRGFFVTKKKYAVIDEE
48	201	TDGLHATIPGADAETVKKK	KAMEFLNYINPKLPGLLELEYEGFYVRGFFVTKKKYAVIDEE
55	202	TDGLHATIPGADAETVKKK	KAMEFLNYINPKLPGLLELEYEGFYVRGFFVTKKKYAVIDEE
64	204	TDGLHATIPGADAETVKKK	KAMEFLNYINPKLPGLLELEYEGFYVRGFFVTKKKYAVIDEE
Jdf3	541	TDGLHATIPGADAETVKKK	KAMEFLNYINPKLPGLLELEYEGFYVRGFFVTKKKYAVIDEE

4	260	GKITTRGLEIVRRDWSEI	AKETQARVLEAVLRHGDVEEAVRIVREVTEKLSKYEVPPEKL
10	261	GKITTRGLEIVRRDWSEI	AKETQARVLEAILRHGDVEEAVRIVREVTEKLSKYEVPPEKL
13	261	GKITTRGLEIVRRDWSEI	AKETQARVLEAILRHGDVEEAVRIVREVTEKLSKYEVPPEKL
16	261	GKITTRGLEIVRRDWSEI	AKETQARVLEAILRHGDVEEAVRIVREVTEKLSKYEVPPEKL
18	261	GKITTRGLEIVRRDWSEI	AKETQARVLEAILRHGDVEEAVRIVREVTEKLSKYEVPPEKL
19	261	GKITTRGLEIVRRDWS	EIAKETQARVLEAILRHGDVEEAVRIVREVTEKLSKYEVPPEKL
28	261	GKITTRGLEIVRRDWSEI	AKETQARVLEAILRHGDVEEAVRIVREVTEKLSKYEVPPEKL
34	261	GKITTRGLEIVRRDWSEI	AKETQARVLEAILRHGDVEEAVRIVREVTEKLSKYEVPPEKL
41	261	GKITTRGLEIVRRDWSEI	AKETQARVLEAILRHGDVEEAVRIVREVTEKLSKYEVPPEKL
33	261	GKITTRGLEIVRRDWSEI	AKETQARVLEAILRHGDVEEAVRIVREVTEKLSKYEVPPEKL
48	261	GKITTRGLEIVRRDWSEI	AKETQARVLEAILRHGDVEEAVRIVREVTEKLSKYEVPPEKL
55	262	GKITTRGLEIVRRDWSEI	AKETQARVLEAILRHGDVEEAVRIVREVTEKLSKYEVPPEKL
64	264	GKITTRGLEIVRRDWSEI	AKETQARVLEAILRHGDVEEAVRIVREVTEKLSKYEVPPEKL
Jdf3	601	GKITTRGLEIVRRDWSEI	AKETQARVLEAILRHGDVEEAVRIVREVTEKLSKYEVPPEKL

Figure 15